PTLC0514TH – ESD Protection Diode

Feature

- 480 Watts peak pulse power (8/20μs)
- SOT23-6L package
- Solid state silicon-avalanche technology
- Low clamping voltage
- Low leakage current
- Low capacitance (C_J =1.5 pF typ., between I/O)
- Up to four I/O lines of Protection
- IEC61000-4-2 (ESD) ±30kV (Air), ±30kV (Contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
- IEC61000-4-5 (Lightning): 24A (8/20μs)

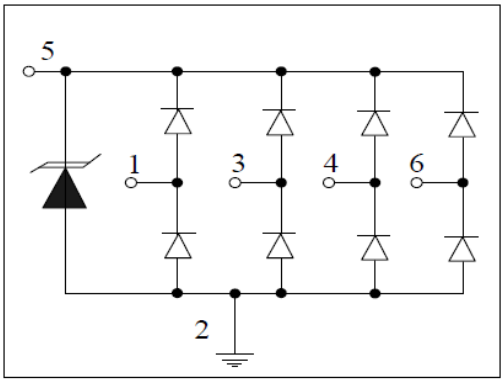
Applications

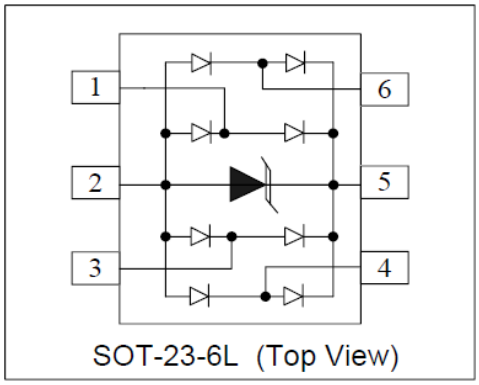
- Video/Graphics Card
- Handheld & Portable Electronics
- PC/Notebook USB2.0/IEEE1394 ports
- 10/100/1000 Ethernet
- DVI interfaces
- Wireless data (WAN/LAN) systems

Mechanical Data

- SOT23-6L package
- Molding compound flammability rating: UL94 V-0
- Tape and Reel Packaging
- RoHS/WEEE Compliant

Schematic and PIN Configuration





Maximum Rating

Parameter	Symbol	Limit	Unit
IEC61000-4-2 ESD Voltage – Air Mode	V_{ESD}(1)	±30	kV
IEC61000-4-2 ESD Voltage – Contact Mode		±30	
Peak Pulse Power	P_{PP}(2)	480	W
Peak Pulse Current	I_{PP}(2)	24	A
Maximum Lead Solder Temperature (10 seconds duration)	T_L	260	°C
Junction Temperature	T_J	-55~125	°C
Storage Temperature Range	T_{stg}	-55~125	°C

Note:

1. Device stressed with ten non-repetitive ESD pulses.
2. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.
3. All ratings are measured at environmental temperature of TA = 25°C unless otherwise noted.

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Electrical Characteristics

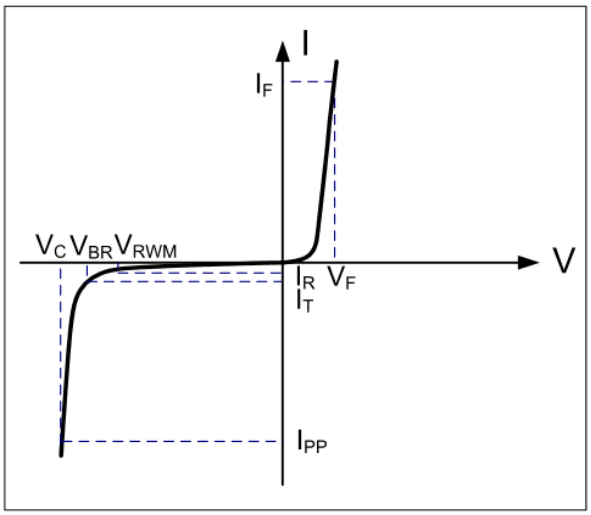
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Stand-off Voltage	V_{RWM}(1)	I/O to GND			5.0	V
Reverse Breakdown Voltage	V_{BR}	I_T = 1Ma, I/O to GND	6.0			V
Reverse Leakage Current	I_R	V_{RWM} = 5V, I/O to GND			500	nA
Dynamic Resistance	R_{DYN}(4,5)	TLP=0.2/100ns		0.25		Ω
ESD Clamping Voltage	V_C(4)	I_{PP} = 4A, tp = 0.2/100ns (TLP)		9.0		V
		I_{PP} = 16A, tp = 0.2/100ns (TLP)		12		V
Clamping Voltage	V_C(2)	I_{PP} = 24A, I/O or VCC to GND		17	20	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHz, I/O to I/O		1.5	2.0	pF
		V_R = 0V, f = 1MHz, I/O to GND		3.0	4.0	pF

Note:

1. Other voltages available upon request.
2. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.
3. All ratings are measured at environmental temperature of T_A = 25°C unless otherwise noted.
4. TLP Setting：t_p=100ns, t_r=0.2ns, I_{TLP} and V_{TLP} sample window:t_1=70ns to t_2=90ns.
5. Dynamic resistance calculated from IPP=4A to IPP=16A using “Best Fit”.

Electrical Parameters

Symbol	Parameter
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Peak Pulse Current
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_R	Reverse Leakage Current @ V_{RWM}
V_{RWM}	Reverse Stand-off Voltage
I_F	Forward Current
V_F	Forward Voltage @ I_T



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Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

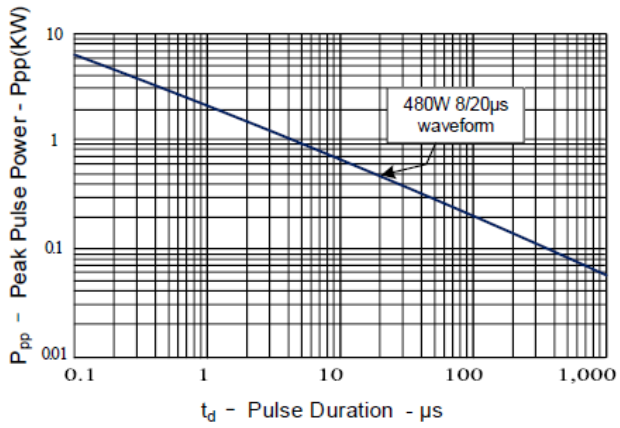


Figure 2: Power Derating Curve

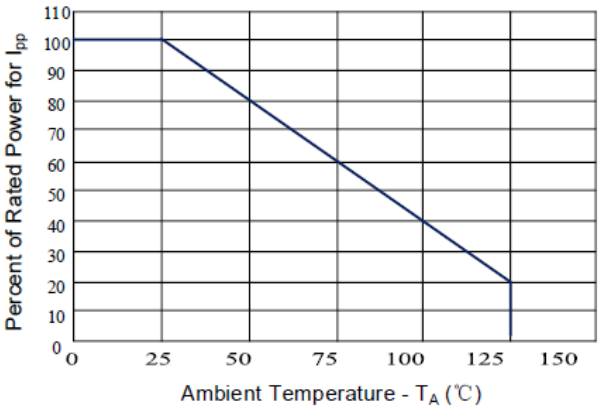


Figure 3: Clamping Voltage vs. Peak Pulse Current（IO or VCC to GND）

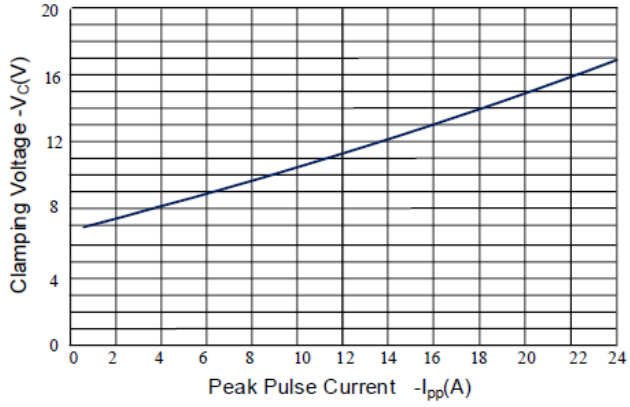


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

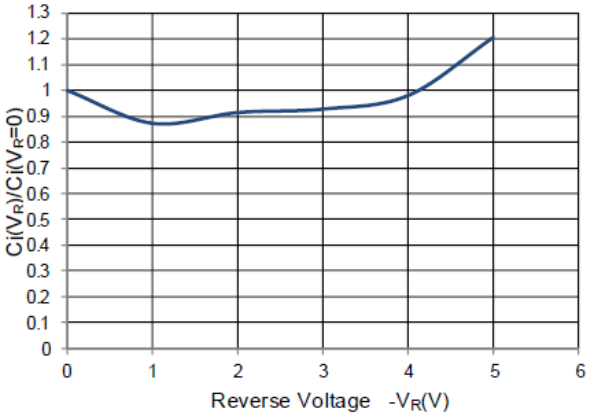


Figure 5: 8/20μs Pulse Waveform

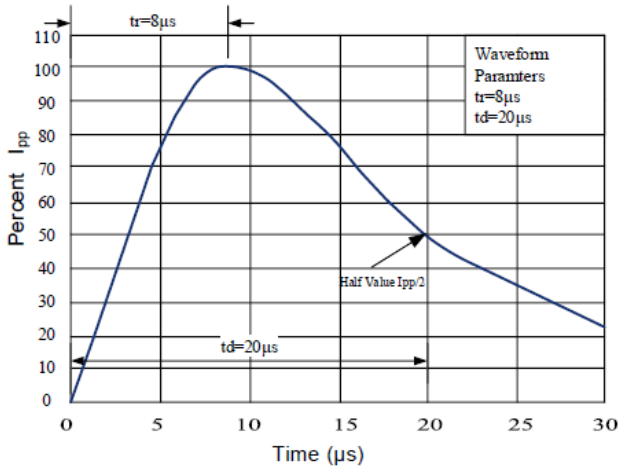
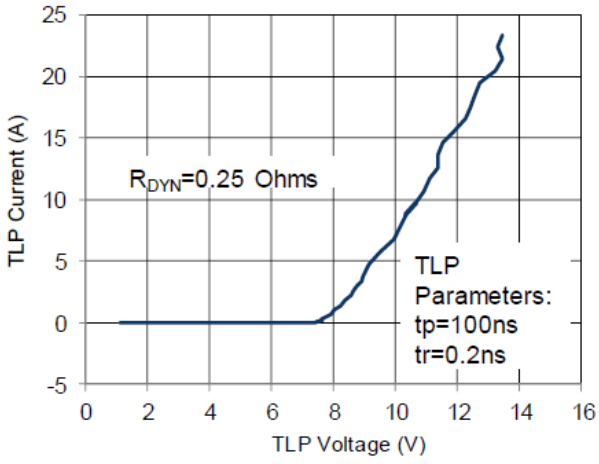


Figure 6: TLP I-V Curve



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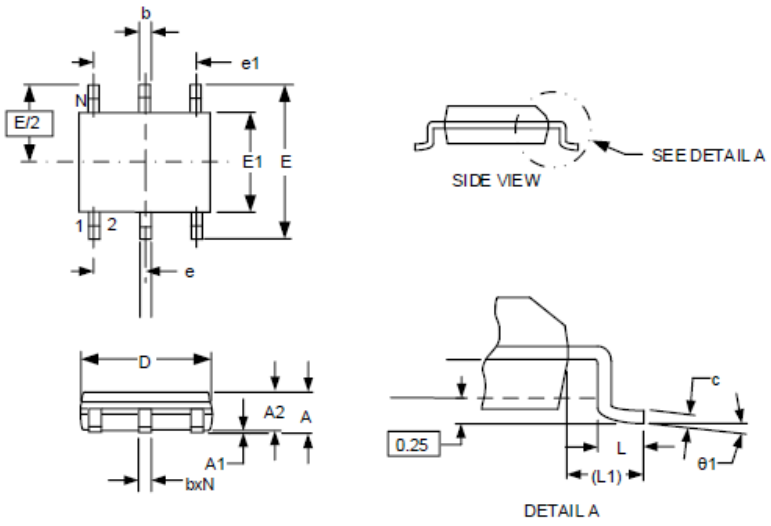
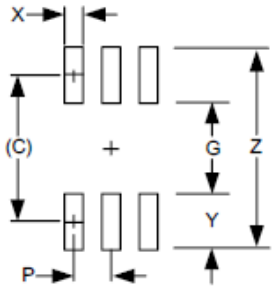
SOT23-6L Package Outline Dimensions



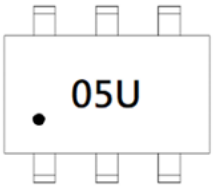
Symbol	Dimensions (mm)	
	Min	Max
A	0.900	1.450
A1	0.000	0.150
A2	0.900	1.300
b	0.350	0.500
c	0.080	0.200
D	2.800	3.020
E	2.600	3.000
E1	1.500	1.750
e	0.950 (BSC)	
e1	1.900 (BSC)	
e1	1.800	2.000
L	0.350	0.600
L1	0.550	0.750
θ	0°	8°

SOT23-6L Recommended Pad Layout



Symbol	Dimensions (mm)
	Typ
C	2.50
G	1.40
P	0.95
X	0.60
Y	1.10
Z	3.60

Marking



Packaging Information

Order Code	Packaging	Reel Size	PCS/Reel
PTLC0514TH	SOT23-6L	7 inch	3,000